IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 15, Issue 1 Ver. VIII (Jan. 2016), PP 80-82
www.iosrjournals.org

Prevalence of Urinary Tract Stones with Geographical Locations of Libyan Patients Presented In Central Hospital, Tripoli, Libya

Khalid A. Bulati[1], Abdelgader A.Traplsi[2] A. Faiz[3]
[1, 2, 3] *Dept. of Urology. Faculty of Medicine, Al-khoms, Libya.*

Abstract: *Urinary stone is the third most common urological disease. Urinary stones are mineral deposition within the urinary tract. Renal stones are common, being present at some time in one in ten of the population. Bladder stones (calculi) account for around 5% of urinary tract stones and usually occur because of foreign bodies and obstruction or infection. Many literatures are available for the formation of urinary tract stones and revealed different reasons are involved in the formation of these stones. The aim of this study is the prevalence of Urinary tract stones in different geographical regions of Libya and the analysis of mineral composition of those isolated stones by different medical procedures from the patients admitted in the Central hospital, Tripoli, Libya. Total of 86 cases of Urinary tract Stone problem were admitted at Central Hospital, Tripoli, Libya for the removal of those stones by various medical procedures and analysed it by FTIR spectroscopy. Regarding the geographical distribution study, Tripoli had the highest incident of the Urinary tract stones problem followed by Al-khoms city. High risk with more cases seen in coastal cities may be due to environmental conditions with high humidity and salinity of water or environmental problems. In addition to that, there is an excessive ingestion of milk and milk products and large amount of animal products like meat. Fewer incidences of calculi in the cities from the south desert area may be due to more physical activities of those people in that area and usage of rain water for cooking and drinking and intake of more dietary food. Urinary tract stone analysis showed that the highest mineral composition of the stone was Calcium Oxalate. Proper education, early detection and prompt treatment help in preventing long-term sequel in patients with Urinary tract stones and it also reduce the recurrence problem of the same type of stone formation.*

Key Words: *Urinary tract stones, Calcium Oxalate, Libyan patients*

I. Introduction

Urinary stone is the third most common urological disease. Urinary stones are mineral deposition within the urinary tract. Renal stones are common, being present at some time in one in ten of the population, although a significant proportion will remain asymptomatic. The annual incidence is about 1-2 cases of acute renal colic (or ureteric colic) per 1,000 people and the average lifetime risk around 5-10%. Men are more commonly affected than women, with a male and female ratio of 3:1. The difference between the sexes is gradually being eroded. This is thought to be due to lifestyle-associated factors, such as obesity and a Western diet. The peak age for developing stones is between 30 and 50 and recurrence is common.

Renal calculi are formed when the urine is supersaturated with salt and minerals such as calcium oxalate, struvite (ammonium magnesium phosphate), uric acid and cystine (Worcester and coe, 2010). 60-80% of stones contain calcium. They vary considerably in size from small 'gravel-like' stones to large staghorn calculi. The calculi may stay in the position in which they are formed, or migrate down the urinary tract, producing symptoms along the way. Studies suggest that the initial factor involved in the formation of a stone may be the presence of nanobacteria that form a calcium phosphate shell (Shiekh et al., 2006).

Bladder stones (calculi) account for around 5% of urinary tract stones and usually occur because of foreign bodies, obstruction or infection (Schwartz and Stoller, 2000). The most common cause of bladder stones is urinary stasis due to failure of emptying the bladder completely on urination, with the majority of cases occurring in men with bladder outflow obstruction. Approximately 5% of bladder stones occur in women and are usually associated with foreign bodies such as sutures, synthetic tapes or meshes, and urinary stasis, so bladder stones should always be considered in women investigated for irritable bladder symptoms or recurrent urinary tract infections (Stav and Dwyer, 2012). Environment temperature, atmospheric pressure, and sunlight are important factors in causing stone, but among these factors, the most significant one is the environment temperature (Wein, 2012).

Ben Halim et al., (2012) have studied about the childhood urolithiasis in North-west Libya and interpreted in the publication that Libyan childhood urolithiasis accounted for 3.6% of nephrology out-patient work load.

The aim of this study is the prevalence of Urinary tract stones in different geographical regions of Libya and the analysis of mineral composition of those isolated stones by different medical procedures from the patients admitted in the Central hospital, Tripoli, Libya.

II. Materials And Methods:

The research work was conducted at Central Hospital, Tripoli, Libya between January 2013 and December 2015. Total of 86 cases of Urinary Stone problem were included in the study. Stone samples were collected after management of different procedures like Medical, Surgical such as ESWL(Extracorporeal shock wave lithotripsy), URS (Ureteroscopy), PCNL (Percutaneous nephrolithotomy) and Crushing stone by stone crusher.

The stones were washed carefully with distilled deionised water and examined for physical characteristics and later dried. The stones were powdered with pestle and mortar. This procedure produced a fine homogenous powder. 100mg of this powder were mixed with potassium bromide and the pellet was subjected to FTIR (Fourier Transform Infrared Spectroscopy, Shimadzu, Japan) analysis. The FTIR spectroscopy was performed using Shimadzu 8700 FTIR Spectrophotometer in the frequency range 600-4000 cm-1.The output graph obtained i.e., percentage of transmission against wavelength were analysed for stone composition comparing with graphs from standard stone library.

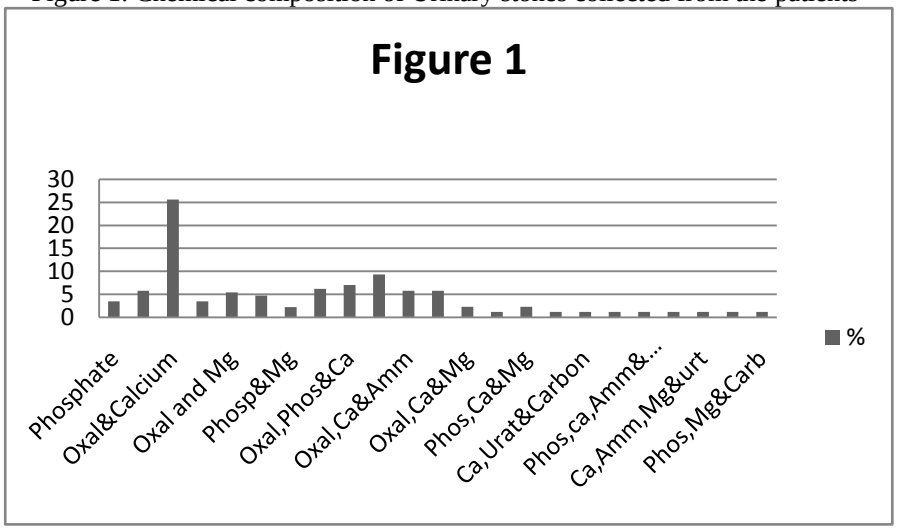
III. Results And Discussion:

In the study period, 86 cases with urinary tract stone problems were diagnosed and admitted in the Hospital for various method of removal those stones. Patients were admitted from 11 different cities from different geographical locations of Libya (table 1). Most of the cases (65.1%) were from Tripoli city with highly crowded and most populated city of Libya. More cases in this city may be due to cosmopolitan life style and the available quality of water in that particular area and the drinking quantity of water of the same people. Another coastal city, Al-khoms had about 14% of the urinary tract stones problem from the total cases admitted. High risk with more cases seen in coastal cities may be due to environmental conditions with high humidity and salinity or environmental problems. In addition to that, there is an excessive ingestion of milk and milk products and large amount of animal products like meat. Fewer incidences of calculi in the cities from the south desert area may be due to more physical activities of those people in that area. These people depend on the rain water for drinking and cooking. They consume more tea and food with more fibre content. These parameters may reduce their urinary tract stone formation.

Table 1: Number of patients with urinary stones from different cities.

City	No. of patient	Percentage
Tripoli	56	65.1%
Al-Khoms	12	13.9%
Tarhona	6	6.9%
Yefren	3	3.5%
Murzog	2	2.3%
Misallata	2	2.3%
Tigy	1	1.2%
Agellate	1	1.2%
Zawia	1	1.2%
Girian	1	1.2%
Benwalid	1	1.2%
Total	86	100%

Figure 1: Chemical composition of Urinary stones collected from the patients



The highest percentage of (25.6%) (Figure 1) mineral composition present in the present study was Calcium oxalate. Ben Halim et al., (2012) also found that Calcium oxalate was the most prominent constituent, seen in 41% of the calculi, followed by struvite (21%), uric acid (10%), carbapatite (7%), and cystine (3.5%). But Sial et al,(1995) reported that the pure calcium oxalate stones were 5 (10%), calcium oxalate plus calcium phosphate were 10 (20%) and stones having uric acid in mixed form were 60%, although sample size was small (n=50). These results are not similar to the present study. The factor that leads to stone production is the formation of Randall's plaques. Calcium oxalate precipitates form in the basement membrane of the thin loops of Henle; these eventually accumulate in the subepithelial space of the renal papillae, leading to a Randall's plaque and eventually a calculus (Evan et al., 2006).

IV. Conclusion

In Libya, geographical distribution, diet, habit, environment, social and occupational factors are very important that predispose to urinary tract stones. Highest incidence rate was observed in Tripoli and followed by al-khoms. The most common urinary tract stone's mineral composition is Calcium Oxalate. Proper education, early detection and prompt treatment help in preventing long-term sequel in patients with Urinary tract stones.

V. Recommendation To Prevent The Recurrence

Recurrence of renal stones is common and therefore patients who have had a renal stone should be advised to adapt and adopt several lifestyle measures which will help to prevent or delay recurrence (Guidelines on Urolithiasis, 2015):

1. Increase fluid intake to maintain urine output at 2-3 litres per day.
2. Reduce salt intake.
3. Reduce the amount of meat and animal protein eaten.
4. Reduce oxalate intake (foods rich in oxalate include chocolate, rhubarb, nuts) and urate-rich foods (eg, offal and certain fish).
5. Drink regular cranberry juice: increases citrate excretion and reduces oxalate and phosphate excretion.
6. Maintain calcium intake at normal levels (lowering intake increases excretion of calcium oxalate).
7. Depending on the composition of the stone, medication to prevent further stone formation is sometimes given - eg, thiazide diuretics (for calcium stones), allopurinol (for uric acid stones) and calcium citrate (for oxalate stones).

References

[1]. Ben Halim M, Bash-Agha I, Elfituri O, Turki M and Hawas A (2012) Child hood Urolithiasis in North-western Libya. Saudi J Kidney Dis Transpl 23(1):162-170.
[2]. Evan A, Lingeman J and Coe FL (2006) Randall's plaque: pathogenesis and role in calcium oxalate nephrolithiasis. Kidney Int. 69(8):1313-1318.
[3]. Guidelines on Urolithiasis (2015) European Association of Urology.
[4]. Schwartz BF and Stoller ML (2000) The vesical calculus. Urol Clin North Am. 27(2):333-346.
[5]. Shiekh FA , Khullar M and Singh SK (2006) Lithogenesis: induction of renal calcifications by nanobacteria. Urol Res. 34(1):53-57.
[6]. Sial JS, Khan J, Iqbal S, Akbar A and Khan F (1995) Chemical analysis of renal calculi from D.G. Khan. Professional Med J.2:89-93.
[7]. Stav K and Dwyer PL (2012) Urinary bladder stones in women. Obstet Gynecol Surv. 67(11):715-725.
[8]. Wein AJ (2012) Campbell-walsh urology. 10th ed: Saunders Elsevier. Worcester EM and Coe FL (2010) Clinical practice. Calcium kidney stones. N Engl J Med. 363(10):954-63.